

LEO ELOESSER, M. D., (490 Post Street, San Francisco).—A very few remarks might be added to Doctor Ziegelman's complete review of facts that permit of no discussion.

Esophageal traction diverticula may be caused by the adhesions of small tracheal cysts, or tracheal diverticula, which are seemingly not so rare. The cough of pulsion diverticula is not only due to nerve irritation—the cough is usually productive—due to more or less aspiration if the mass of food is secretion which overflows into or near the laryngeal entrance. A Levin tube passed through the nose into the stomach before operation and allowed to remain for four or five days afterward is helpful in assisting stomach to feed and to keep the esophagus completely at rest. It may, however, be difficult or impossible to pass the tube into the stomach without the help of an esophagoscope—a stiff tube or a bougie should never be used. They are likely to perforate the sac. I suppose that the two-stage operation is probably safer, especially in very old persons with a thin-walled sac. The Jackson-Babcock esophagoscopic method is good in the hands of a perfectly well-trained and careful endoscopist, otherwise esophagoscopy had better be foregone, for it is extremely easy to perforate these thin-walled sacs.

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ERNST GEHRELS, M. D. (490 Post Street, San Francisco).—From the surgical point of view I wish to amplify a few points.

1. It is advisable to operate these diverticula under local anesthesia. General anesthesia has the definite danger of aspiration of the contents of the sac during the operative manipulation. I use block anesthesia of the cervical plexus on the left side and infiltration of the line of incision of the skin.

2. It is hard to understand why the majority of publications still favor a longitudinal incision at the anterior edge of the sternocleidal muscle. I have found a transverse incision very satisfactory, even in the removal of very large diverticula. Cosmetically, of course, this is much better.

3. While the two-stage operation is still being chosen by the majority of surgeons, I favor the one-stage operation, unless the diverticulum is unusually large. Soiling during the operation can be avoided if one is careful. There is some danger of opening the sac inadvertently in the act of separating the diverticulum from the esophagus itself. At the end of the operation, a gauze pack in the lower angle of the wound will protect mediastinum sufficiently, in my opinion, in case the suture line should open. In using a two-stage procedure it is of great importance to free the diverticulum to the very neck. In the second stage the tissues are edematous and it is impossible to complete the dissection if it has been done incompletely before.

4. Danger of recurrence after a correctly done operation appears to be very small. In 225 one-stage operations compiled by Lotheisen, there were only three recurrences. The incidence of recurrence may be greater in the two-stage procedure, the excision of the sac often being less complete.

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DOCTOR ZIEGELMAN (Closing).—Pharyngogenesis, which appears to affect the cricopharyngeus muscle, must be given consideration when the etiology of this lesion is being discussed. Pharyngo-esophageal diverticula are usually first seen by the laryngologist. The necessity for him to keep in mind a mental picture of this entity, with its early symptoms, is self-evident. It is a border-line lesion between the otolaryngologist, the peroral endoscopist and surgeon. A beautiful example of Dr. W. J. Mayo's definition of a specialist: "One who knows a little more, and more about something less and less." The method of treatment depends upon the experience of the attendant. I am convinced that those who have had great experience with the surgical anatomy of the lower neck, with its surgical appli-

cation, as in the field of thyroid surgery or larynx, are better able to handle these lesions. I have seen this demonstrated on more than one occasion by my former associate, Dr. Thomas Joyce. The dangers of the combined operation have been so nicely mentioned by Doctor Eloesser. Unless one is an adept with the esophagoscope, perforation of the pouch may occur. This method has the advantage that it orientates the sac by transillumination. It lessens the danger of injury to contiguous structures, with subsequent complications, such as mediastinitis, hemorrhage and recurrent paralysis. Any procedure that minimizes such complications should be accepted. The two-stage method seems to accomplish this. When the specialty of peroral endoscopy has developed to a more uniform strata of experience and skill as manifested by Jackson, Mosher and others, the combined method may supersede the two-stage technique. I am inclined to believe that such a condition will occur, for the specialty of peroral endoscopy is a fertile field for young men with good vision, as shown by the recent report of Vinson on one thousand carcinomas of the esophagus.

PHYSIOTHERAPY AND OCCUPATIONAL THERAPY*

By IONE PINNEY, M. D.

Stockton

DISCUSSION by Charles Lewis Allen, M.D., Los Angeles; C. W. Grady, M.D., Palo Alto; T. H. Stice, M.D., Imola.

ALL forms of physiotherapy are not applicable in the treatment of the mentally ill because of lack of coöperation on the patient's part. The two physical measures of greatest value and most extensively used are hydrotherapy and occupational therapy.

Hydrotherapy, which is the use of water as a remedial agent, has been recognized as a method of treatment since the time of Hippocrates. While of late years efforts have been made to scientifically demonstrate its usefulness, much remains to be proved. In the treatment of mental cases, its use may often be said to be empirical. Hydrotherapy has proved of great value to the insane, and was first used in such cases over a hundred years ago in France. In England, in 1796, the surgeon, James Currie, treated maniacal patients successfully with cold baths. About ninety years ago Dr. Isaac Ray advocated use of prolonged neutral baths to produce sleep in nervous and mental affections. Today, every hospital for the care of mental cases makes use of some form of hydrotherapy, and many are well equipped with apparatus such as cabinets, tubs, and sprays.

REASONS FOR HYDROTHERAPY

The scientific application of hydrotherapy is based upon the physiological effects of heat and cold, plus, in some cases, friction and pressure. Heat and cold bring about metabolic changes in the tissues. Rubner has demonstrated that baths of five minutes' duration or less, may, according to their temperature, radically modify metabolism, as proved by the alteration in the amount of O absorbed and CO₂ given off in respiration. A

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cold douche increases greatly the oxidation of the body, a douche of 60.8 degrees Fahrenheit increasing by about 50 per cent the weight of O inspired and CO₂ expired. The increased metabolism is said to persist for an hour or more after the douche. The effect is probably largely due to a reflex excited by the cold water falling on the skin. The aim, however, therapeutically, is the establishment of what is called a "physiological reaction," which results in the amelioration of pathological symptoms. It is thought that the physical basis of such a reaction may be metabolic changes, and that they may be apprehended by making use of direct or indirect calorimetry. It is known that the sedative bath (95 degrees Fahrenheit) has no effect upon metabolism; whereas, with higher temperatures, metabolism is said to again increase, possibly because the tissue cells are warmed and their activities accelerated. Rubner found that in a hot bath (111.2 degrees Fahrenheit) there was a marked increase in respiratory movement and in the gas exchange. Hinsdale states that short cold shower baths increase heat elimination, but claims that cold *per se* reduces the oxidizing capacity of animal tissues, and that warmed tissues have a much higher rate of oxidation. If we consider that the increase in weight of O and CO₂ exchanged, following the cold douche mentioned by Rubner, is a secondary effect of cold, then we see wherein the statements agree. Some of the physiological effects of cold are: increased vigor, increase of red cells and diminution of leukocytes, slower but more vigorous heart action, temporary acceleration of respiration followed by slow, full, deep respiration, and a rise of blood pressure. In the application of heat we must recognize that, while there is at some stages an increase in metabolism, the mechanism, resulting from heat loss where cold is applied, is lacking. If when heat is applied evaporation is prevented, the body temperature will rise and may continue to rise after the bath, requiring an hour or two to return to normal. Hot baths promote sweating, diminish the output of urine, increase blood pressure, increase respiration and the pulse rate, and are said to excite the nerve centers. The secondary effects are sedative sometimes to the point of collapse. When heat is applied so as to obtain the desired "physiological reaction," metabolism is enhanced and elimination of various poisons and toxins augmented. Fox claims that the power of response of tissues to applications of heat and cold, and the production of secondary consequences in the entire organism, are the whole key to hydrotherapy. It must be recognized that the reaction is not always the same in any given individual, and that in every case there is a point at which heat or cold ceases to evoke a healthy reaction.

CONTINUOUS HEAT PACKS

The continuous bath and the neutral sheet pack are of most use in caring for mental cases. Both are indicated in the treatment of the manic phase of manic-depressive psychoses and in the disturbed dementia praecox. The continuous bath permits greater freedom of movement, and the

patient can be kept in the bath all day or longer if desired. The temperature of the water should be kept at 95 or 96 degrees Fahrenheit, because higher temperatures (even 98 degrees Fahrenheit) tend to increase respiratory movements and entail a strain on hearts that may already be overtaxed. At 95 degrees Fahrenheit there is less likely to be an appreciable rise in the blood pressure. The results obtained are an improvement in the skin's activity, with some increase in elimination of poisons and sedation, so that the maximum of rest, a very necessary condition, is obtained. Patients that are wearing themselves out physically, and who respond poorly to sedatives, usually do well in continuous tub baths. Besides the manic and the excited praecox, restless and confused arteriosclerotic cases, alcoholic psychoses, and drug addicts, some paretics, and a few selected cases of epilepsy are the types that usually respond nicely to continuous tub baths. Mental patients who, because of poor reactions, cannot remain in the tub more than thirty or forty minutes, seldom benefit from such treatment. The best results are obtained in cases where the patients remain two to four hours in the tub.

NEUTRAL PACKS

Neutral packs have a sedative effect in hyperactive cases when the packs are repeated frequently throughout the day, provided the patient is not restless while in them. If a patient thrashes about continually, he will only wear himself out and bring on an undesirable reaction. The daily neutral pack of forty-five minutes to one hour, followed by the spray, induces a general tonic effect. The temperature of the water from which the sheets are wrung should be at least 98 degrees (preferably around 110 degrees), because in mental cases the stimulating reaction produced by cold is seldom desired. Excited patients do not need the stimulation, and depressed mental patients fail to react well to cold applications. To obtain the best results the patient should be comfortably warm before the pack is applied, and it sometimes is necessary to give a warm bath or a short cabinet treatment first. The reaction to the heat abstraction which occurs during the first few minutes in pack is thus lessened and the sedative action more prompt. A slight rise of body temperature occurs and a sense of warmth, drowsiness, and sleep are the results. The patient may be left in pack from forty-five minutes to two hours, but if heat loss is prevented too long, the patient perspires freely, respiration and the pulse rate are increased, and the face flushes. When such symptoms occur, the neutral stage of the sheet pack is past, and unless we particularly desire to increase elimination the patient should be removed from pack and put under the spray. All packs should be followed by a short application of cold in the form of sprays, douches, or affusion, by which means we may stimulate metabolic changes. Such an application should start at 100 degrees, rise to 110 degrees, and be lowered to 97 degrees for excited types, and to between 80 and 90 degrees for those who need stimulating. Three minutes is long enough for the entire ap-

plication, and the temperature for mental cases should never be dropped below 78 degrees Fahrenheit. Neutral packs are of value in all cases except those with high blood pressure, skin lesions, seniles, paretics, and excited mental defectives. The latter are inclined to resist packs. Epileptics, from the standpoint of elimination and general toning up, are safer treated by packs than by continuous baths. Depressed patients who react poorly can be greatly improved by intelligent handling in packs, gradually bringing about the stimulation that their bodies need.

CABINET TREATMENTS

Cabinet treatments, either steam or electric, are useful in mental cases where elimination especially needs stimulating, such as alcoholics or the obese, and in bringing about body warmth in the poorly nourished, retarded cases. The temperatures used are around 130 degrees for about ten to fifteen minutes in the first types, and 90 to 95 degrees for six or seven minutes in the last type mentioned.

HYDROTHERAPEUTIC TREATMENT OF THE PSYCHOSES

The hydrotherapeutic treatment of the psychoses outlined is based upon sixteen years' of experience. For the past eight years I have insisted upon continuous baths being kept at 94 to 96 degrees Fahrenheit, and have had only one case that bordered upon collapse. Last year, in ten months, some seventy women patients received 2,450 continuous baths. The average duration per bath would run above two hours. Some were kept in tub for seven or eight hours daily, reducing the time as they improved. In addition to neutral packs given to chronic cases on the wards during disturbed periods, the women's hydrotherapy department, which is part of the receiving service, last year gave 3,621 neutral packs and sprays, 1,382 cabinet treatments, 172 shower baths, 25 salt glows, and 24 fomentations.

In the treatment of the psychoneurotic case, any form of physiotherapy may be used that is indicated and meets with the patient's approval. Massage and passive gymnastics have no special place in the treatment of the nervous mental case. Electrotherapy, according to some authorities, does not fall under the head of physiotherapy. Its specific uses in mental cases are in the field of diathermy for paresis, and roentgen-ray treatment for the purpose of sterilization.

OCCUPATIONAL THERAPY

Occupational therapy is a very old method of treatment. The Egyptians, when they built temples dedicated to Saturn in 200 B. C., recognized the benefit of "pleasurable occupation," and Galen in the year 172 A. D. wrote, "Employment is nature's best physician, and essential to human happiness." In 1791 the insane in France were liberated from their chains and put to work at normal occupations. In this country, in 1798, Dr. Benjamin Rush of Philadelphia began to use occupational therapy when he put groups of mental patients to work—the women at sewing, and the

men at farming and carpentry, and furnished out-of-doors amusement for others.

Occupational therapy applied to mental cases becomes the main highway over which they travel back to a readjusted life in their communities. By its use mental and physical deterioration is either prevented, lessened, or delayed. Kraepelin stated, "Occupation alone can preserve, by exercise, the capabilities which still remain and prevent . . . wholly sinking into dulness." The occupational therapist must understand the crafts, and know how to apply them to the various types of mental cases. Awakening of interest, sustained effort and attention, replacement of morbid ideas with healthy ones, and establishing mental and motor control and coordination, are results sought and obtained in the mental sphere; whereas, improvement of individual and group morale, and opportunities for social adaptation in work and recreation, are developed in the social field. Physical training, which requires the active participation of the patient, and recreation, are, with the crafts, the tools used to obtain desired results. Habit-training must be instituted for those whose habits are disorganized. Such training requires much patience and persistence, but its results are worth while from the rehabilitation and economic standpoint.

In our state hospitals the occupational therapy department is well developed, and recognized as a valuable therapeutic agent. The classes for men and women are separate, but all social activities bring them together under as normal circumstances as possible.

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DISCUSSION

CHARLES LEWIS ALLEN, M. D. (214 South Lafayette Park Place, Los Angeles).—Hydrotherapy has been used more or less in the treatment of the insane since antiquity, though at one time it was applied as a disciplinary and punitive measure, rather than therapeutically.

It is only of recent decades, however, that it has become a routine practice in the psychiatric hospitals of the United States.

In a psychiatric experience of over forty years, the introduction of water treatment by the bath and pack, as also by hyperdermoclysis of salt solution accompanied, when needed, by glucose intravenously, has impressed me as the greatest therapeutic advance in our specialty, with the possible exception of the newer antisiphilitic methods.

The continuous bath and the pack reduce excitement and favor sleep, in the majority of cases, and the rightly dreaded "acute delirium" presents now a much more favorable prognosis, since we have come to regard its symptoms as due chiefly to dehydration and acidosis, to be handled by salt infusions and glucose—measures which seem almost specific here.

However, hydrotherapy is not a cure-all. Some patients are not relieved by it; and there are not a few contraindications, as Doctor Pinney has been careful to mention.

The continuous bath should be, of course, in charge of an experienced person, the patient under constant observation, and the temperature of the water be frequently noted, since the best thermoregulator may sometimes go wrong. On this account, also, it is held that any cover preventing the immediate removal of the patient from the tub should be avoided. Epileptics and paretics subject to seizures should be strictly watched.

While the tepid or neutral pack is extremely valuable and requires no special apparatus, it is not tolerated for an indefinite period and should be used with caution in those having circulatory disturbances, and avoided in those who are frightened by it or persistently resist and struggle to get out of it. It has seemed to me that in institutions in which every kind of mechanical restraint is strictly forbidden, there is a tendency to make too free use of this "therapeutic restraint," which may have disastrous consequences.

The hot cabinet, followed by a douche regulated as to temperature and pressure, is an important measure, but finds its chief place with the quiet and convalescent patients, especially those of neurasthenic type and those whose nutritive processes need stimulation. It is usually contraindicated in disturbed and delusional patients.

Occupational therapy is no new thing, but has been used in institutions for an indefinite period. Ability to keep a large percentage of its patients occupied has always marked a well-managed hospital. However, the occupation furnished the patients was formerly almost exclusively that of the house, kitchens and laundry indoors, and of the farm and garden outdoors.

The newer mechanical and artistic shopwork of the occupational therapy rooms, if made sufficiently interesting, may attract many persons, especially those who have never been accustomed to do what they regard as menial work and beneath their dignity.

Here everything depends upon the experience, enthusiasm, skill and tact of those in charge of the work. It often takes considerable ingenuity to get the patients to work, and many persistently refuse.

All appearance of compulsion should be avoided, but there is nothing worse for a chronic patient than sitting idle about the hall all day.

Doctor Pinney has given us an interesting, instructive and well-balanced paper, which should reach not only the specialist but also the general practitioner, and should encourage the more extended use of the physical measures of treatment which have been too much neglected in our country.

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C. W. GRADY, M.D. (Veterans' Administration Facility, Palo Alto).—Far too often physiotherapeutic measures, especially hydrotherapy, are used in a routine manner with little understanding of the rationale involved. Doctor Pinney's exposition of the physiological processes involved in the application of various forms of hydrotherapy is, therefore, especially valuable. Failure to obtain satisfactory results from use of the continuous tub may sometimes be due to too brief applications. While it is understood that the condition of the patient must at all times be considered, this writer has noted with agreeable surprise that many patients remain in perfectly satisfactory condition during a treatment of fifteen to twenty hours, sleeping and taking nourishment regularly throughout, being removed only when it is necessary to evacuate the bowels. It is also interesting to note that many patients, especially manics who have been subject to recurrent attacks of hyperactivity, have developed a certain amount of insight, and appreciate the relief to be obtained from continuous bath therapy and will voluntarily ask that it be given them at the onset of the attack.

As the doctor has pointed out, hydrotherapy is a measure not easily dispensed with. More stress might be placed upon the psychotherapeutic value of the various methods of electrotherapy, particularly in the various aspects of the neuroses. Neuroses are real disabilities, many times more disabling and nearly always less amenable to treatment than actual physical ailments. Such measures as diathermy, high frequency, ultra-violet ray, and sinusoidal wave, offer a form of treatment which the neurotic is able to see and appreciate. Such treatments, given along with positive and assuring advice as to what is expected to be accomplished, are of great help.

Much has been written as to the value of occupational therapy. It cannot be emphasized too strongly, not only with respect to the patient, but to those who are caring for him. From the patient's standpoint, occupation is the means of making extensive institutional life bearable.

From the standpoint of a State-supported institution, the economic value is great. In whatever degree a patient has been able to care for himself, by so much may the personnel be reduced. In many institutions, not only is much of the labor of upkeep done as an occupational therapy project, but a large portion of foodstuffs are produced as well.

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T. H. STICE, M.D. (Napa State Hospital, Imola).—I was very much interested in Doctor Pinney's paper on physiotherapy and occupational therapy.

In 1905 and 1906, articles began to appear in some of the leading medical journals regarding the effect of hydrotherapy upon the insane. We had not been doing any hydrotherapy work in this State at that time, and after having read a number of these articles setting forth some of the results claimed by those hospitals in the East who were trying out the different forms of baths, I became much interested, and made an effort to get some sort of equipment in the Napa State Hospital, where I was then employed. As you all know, to get a thing of that kind for State hospital work, especially one that has not been tried out, is a very slow procedure.

In the meantime, I improvised two continuous baths from ordinary bath tubs by putting a hammock in the tub, with an outlet near the top; and with this improvised make-up, made a number of experiments and found that, with the disturbed manic cases, I got very surprising results.

I think at that time, so far as I knew, I was probably one of the first in the State institutions to make such experiments. My results were so satisfactory and so encouraging, especially with the acutely disturbed patients, that I also had a crude mixing chamber added to my equipment, so as to keep the water a more even temperature and lessen to a great extent the possibility of an accident from scalding.

It was not many months until the other State institutions for the insane learned of our experiments at the Napa State Hospital, and a number of doctors came over to see the actual operation and to learn as much as possible about what we were able to accomplish. Everybody became interested in the results obtained, and it was with concerted effort and concerted demands of the medical staffs of the various hospitals that we finally induced the Lunacy Commission to assist us in providing funds for equipments for the different institutions.

Today we wonder how it was possible for us to have gone as long as we did without such equipment, as the outfit has gradually been improved upon so that it is perfectly safe. It is very reliable as to maintaining an even temperature, and there is practically no danger of burning a patient or giving shock by getting a poor mixture of hot and cold water.

By the use of hydrotherapy, as outlined by Doctor Pinney in her paper, we are able to quiet these noisy and disturbed patients without having to resort to the hypnotics, which are more or less harmful in such cases, owing to the fact that they do cause more or less confusion from their after-effects. A very fortunate thing regarding the use of hydrotherapy is that as a general thing the patients, however violent they may be, after having had one such treatment are no longer dreading them, but in fact enjoy the treatments. It is very comforting to go into the pack room, where probably twenty-five or thirty patients are all in the packs, and find that over half of them are actually asleep. After all, any treatment that will quiet the patient to the extent that will cause a natural sleep is always very beneficial, and after you have

begun to induce natural sleep your patient has begun to improve; and this is the beginning of allayed excitement and putting the patient more nearly in a normal physiological condition, so far as controlling the mind is concerned.

I notice that Doctor Pinney advises that the temperature of the continuous bath be kept between 95 and 96 degrees Fahrenheit, and I think, from my experience, that she is absolutely correct. At first, in the use of these baths we were taught that they should be kept at blood temperature; but it was afterward learned that such temperature was a strain on the heart, and that the patient could not be kept in the bath long enough to get as good results as could be obtained by a lower temperature. I think it is conceded by everyone who is now using the continuous baths that 96 degrees is about the right temperature.

I have often been asked if in arteriosclerotic cases, and with patients having any kind of heart trouble, it were not exceedingly dangerous to put them in either the blanket pack or the continuous bath. I am glad to say that in many years' experience with these cases it was very seldom indeed that I saw any patients who had to be taken out of the bath on account of the strain on the heart, provided the water had been set at the proper temperature. In the hospitals of today we have only those that are thoroughly trained in the use of these baths, who watch their temperatures carefully, and who know what to expect, should anything go wrong; and for that reason our nurses seldom make mistakes. They are taught that they must be exceedingly careful, and that the temperature must be carefully scrutinized before the beginning of every bath, so that no possible accident can occur. During the past year we have averaged over 58,000 hydrotherapy treatments per month, and when I tell you that in the administering of that large number we have not had one single accident, it will demonstrate to you what I mean by providing "trained people" to give these baths.

Fortunately for those who are specializing in psychiatry we are constantly learning more regarding the use of hydrotherapy. A very important thing is the fact that our hydrotherapists, who are doing this work under the direction of the doctors, learn to individualize, and so some patients take kindly to one kind of treatment, while others with similar afflictions, do not, and it is important that our hydrotherapists should be able to distinguish the difference and to call the attention of the doctors to these things in order that the patients can be given such baths as they respond to most readily.

Occupational Therapy.—Doctor Pinney has given a very concise and a very clear outline of the use of occupational therapy. We who are doing hospital work realize its very great importance, since it is really the beginning of our rehabilitation and readjustment of the mental cases. We do not accomplish much in occupational therapy until after the manic state has been passed and the confusional state cleared up to the point of attracting and holding the attention of the patient.

The next thing I think of great importance is again individualizing the patients, to learn what each one in particular might most readily be interested in. If you attempt to use occupational therapy along the lines where the patient is not at all interested, you do not get the results by any means that is obtained when you have found something the patient is actually interested in doing.

It is very remarkable in some of these patients as to how far they can be led away from their imaginary troubles, and their minds diverted along lines that prevent their worrying.

Not only is occupational therapy a very important adjunct in our treatment of these cases, but I have seen many patients with dementia precox who have been trained to that extent that they can more readily adjust themselves to outside conditions, and oftentimes later earn a livelihood from what they have been taught while in the hospital.

GONORRHEAL ARTHRITIS—ITS TREATMENT BY ELECTROPYREXIA*

By RODNEY F. ATSATT, M. D.

AND
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DISCUSSION by A. Elmer Belt, Los Angeles; J. S. Hibben, M. D., Pasadena; Clark M. Johnson, M. D., San Francisco; Norman Epstein, M. D., San Francisco.

THE "cleansing fire" of electrically generated heat in the form of hyperpyrexia has opened up a new avenue in the treatment of one of our most discouraging and chronic diseases, namely, the arthritic manifestations of gonorrhea.

GONORRHEAL ARTHRITIS

Gonorrheal rheumatism is the most common of the systemic results of this infection, and according to Jeck¹ has an incidence of from 1 to 3 per cent. The several types of arthritis are the serous, the serofibrinous, the rare empyemic or purulent, and, the most important, the phlegmonous. Many remedies have been suggested and used in the treatment of this complication; but by their very multiplicity they announce their ineffectiveness. Stripping of the seminal vesicles, and a rigorous attack on the cervix and associated glands are the most universally accepted methods of allaying the focal infection. Surgical methods are also employed at times. Nonspecific protein therapy, such as typhoid vaccine intravenously, and milk, aolan and omnadin subcutaneously, has been found of some value. Specific vaccine and serums have also been used. However, none of these methods have given the striking results which one desires in the treatment of a specific disease.

TREATMENT OF GONORRHEA BY ELECTROPYREXIA

The rationale of the treatment of gonorrhea by electropyrexa is based on the fact that the gonococcus is relatively thermolabile, is easily killed *in vitro* by slightly increased temperatures, and probably even more easily affected *in vivo* by the combination of heat and immunologic factors. Warren and Wilson² found that, of fourteen female patients with positive smears from salpingitis or cervicitis, or both, who received adequate treatment with hyperthermia, 71 per cent showed consistently negative smears, indicating an apparent change in the status of their localized infection. Bishop, Horton and Warren³ reported the use of hyperpyrexia in the treatment of nine cases of gonorrheal arthritis with excellent response, and thus we were led to try this method of treatment.

APPARATUS USED

In our experience, four pieces of apparatus are essential in the production of artificial fever. The first is a rugged diathermy machine, the second

* From the Physical Therapy Department of the Santa Barbara Cottage Hospital.

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